

ELECTRIC UTILITIES 101

October 15-16, 2019
Hyatt Regency Suites
Atlanta Northwest
Atlanta, GA

“

“This course provided a great overview of power generation, transmission, distribution, emerging trends and current challenges in the power industry. Most importantly, the presentation was interesting and easy to follow. It’s a great orientation for newcomers to the power industry.”

Corporate Counsel, Ameren



EUCI is authorized
by IACET to offer
1.1 CEUs for the
course

OVERVIEW

This seminar is targeted toward increasing the knowledge of non-technical staff who work or have an interest in the electric utility industry. Participants who are not familiar with utilities and electric power systems can significantly benefit from attending. Since this is a basic seminar, a prior background in electric utility systems or engineering is not expected or required.

The seminar discusses basic concepts ranging from “what is electricity?” to the functions of the major components in electric power systems. The attendee will learn how generation, substations, transmission and distribution function together to provide a reliable energy supply chain. The seminar identifies opportunities, challenges and uncertainties facing the electric utility industry resulting from a paradigm shift driven by customers, technology, legislation and regulation.

Unlike many courses, this course will provide the participants with useful reference materials which will assist them as they work with and in the electric utility industry.

The seminar is presented in a professional manner which is not stressful. No one will be called on to participate; however, it is delivered in a way which encourages questions and interactive discussions between the attendees and the instructor on the issues they are facing and the things they want to learn. It is not death by PowerPoint. The participants will have a fun and rewarding learning experience.

The following topics will be included from a non-technical perspective:

- A history and background of the electric industry
- The major non-utility players in the industry
- Types of electric companies; IOUs, cooperatives, public power and government utilities
- What is electricity and its voltage, current and resistive components?
- What is power and how does it relate to voltage, current and resistance?
- Real and reactive power and their role in the electrical system?
- Power factor and load factor?
- What is single phase and three phase power? How are they produced and used?
- Types and reasons for diverse forms of generation; Traditional and renewable
- Distributed energy resources (DER); Solar, batteries, customer self generation
- Energy efficiency and demand response's role in the new utility marketplace
- The role of substations in a reliable electric grid
- The types and functions of transmission lines in the energy supply chain
- Major components in the distribution systems and how they contribute to a reliable system
- The key performance indicators used in monitoring reliability
- The Paradigm shift occurring in the industry and its marketplace from vertically integrated to distributed energy resources
- The need for non-traditional rate structures. The evolution in rates such as the REV in NY
- Strategic technologies and their impact on both the utilities and its customers; Smart Grids
- Changing customer's needs, wants, expectations and demographics and how utilities must adapt

LEARNING OUTCOMES

- Review the utility industry and its concepts and hardware used in electric power supply chain
- Discuss the history of the industry and how it continues to evolve
- Identify the non-utility players who shape the industry
- Explain the types of electricity generation and the reasons for their use in the electric system
- Examine the components and functions of substation, transmission and distribution systems
- Analyze the paradigm shift occurring in the industry and its impact on the electric utilities and their customers
- Identify opportunities and challenges in the utility marketplace of the future

WHO SHOULD ATTEND

Anyone who is new to the industry and non-technical staff who are interested in gaining a better overall understanding of the electric power industry. Non-technical contractors, consultants and vendors who work with the electric utility industry and need a better overall understanding of how the industry functions and what challenges it is facing.

TESTIMONIALS FROM PAST ATTENDEES

"Great presentation that taught energy from the ground up." - Regulatory Counsel, North Carolina Sustainable Energy Association

"This course answered all my questions and opened my eyes for what's to come in the future." - Transmission Services Specialist, NV Energy

"From this course I learned a lot about the utility regulations and their applications. I would recommend entry level engineers to take this course." - Application Engineer, CTC Global

"Electric Utilities 101 is a very informative course for non-technical staff. Wallace Barron made the training very interesting, easy to follow and comprehend." - Sr. Business Analyst, NRECA



"This program was very informative. I would recommend everyone to attend this; someone new to the utility business or even someone with many years in the business. Provides a broad range of topics but as well as goes further into the topic with credible information/previous experience in the field."

Public Involvement Rep, Salt River Project

"This course should be standard issue for any professional entering the power industry. I can't imagine more I could in a day and a half to expedite my basic understanding of electric utility systems and commonly used technical terms and concepts." - Assistant General Counsel, Exelon

"Training was beneficial for my career and the networking was great." - Director of Engineering, Knoxville Utilities Board

"The course delivered exactly what the syllabus identified. Very refreshing to attend a course that delivers what it promises." - Senior Account Rep., APS

"Excellent course and speaker. I am a complete newbie to the electricity industry. This course provided a good overview of the industry and was appropriate for my level of knowledge." - Finance Manager, San Manuel Band of Mission Indians

"I am very new to the utility community, I am not an engineer. This course provided critical knowledge at an entry level allowing me to understand the scope of the industry." - Deputy Director, CPUC

"This is a great class for an introduction to basic electricity or even a refresher. I recommend everyone to take this class every 5 years. It covered every topic as well as how electricity is evolving. The course was conducted with 'walking around' terms so I wasn't overwhelmed." - Energy Innovation Analyst, APS

"Excellent speaker, Wallace makes it easy and fun for non-technical people. Relevant and concise course." - Director of Finance, San Manuel Band of Mission Indians

"This course gave me the foundation I needed as I continue with my career in the Utility Industry." - Program Coordinator, APS

AGENDA

TUESDAY, OCTOBER 15, 2019

8:00 – 8:30 am Registration and Continental Breakfast

8:30 am – 5:00 pm Course Timing

12:00 – 1:00 pm Group Luncheon

Introduction of Instructor and Attendees

- Company, where it is located, attendee responsibilities and how long in the industry

Learning Objectives and Goals of the Course

History of the U.S. Electricity Industry

- How the industry began and its early years
- AC vs. DC. Edison and Tesla and “The Battle of the Currents”
- Groups that shaped the industry
- The evolution of state and federal regulation
- Types of electric companies; IOUs, cooperatives, public power and government utilities
- Service areas and retail competition
- Open access, FERC Orders 888 & 889, PURPA and EPAC
- Wholesale markets evolution with RTOs & ISOs
- The Electric utility historical vertically integrated business model
- The risks of a capital-intensive industry

Electricity and Power – An Overview

- Voltage, current and resistance (impedance)
- Power and its relationship to voltage, current and resistance (impedance)
- Electricity measures; kWh, KW, MW, kVA, VARS
- Load Factor and why it’s important
- The concept of load diversity
- Real and reactive power and power factor
- Leading and lagging power in non-technical terms
- The role of capacitor banks in correcting power factor
- Single phase and three phase power. How are they produced and used?
- System Losses, their cause and mitigation
- KPI - reliability indices - SAIDI, SAIFI, CAIDI, etc.

Generation or Power Plants – The First Link in the Power Supply Chain

- Coal, nuclear, natural gas-fired, hydro, wind and solar, batteries and distributed energy resources
- Basic components of generation and how the different components function in the first step of the energy supply chain
- Energy generation by fuel type and how it is evolving due to technology and legislation
- Factors impacting generation fuel diversity
- Energy, capital and O&M costs by type of generation
- Base, peak, intermediate generation and the concept of economic dispatch
- Voltage & frequency and generation’s role in regional reliability

AGENDA

TUESDAY, OCTOBER 15, 2019 (CONTINUED)

Substations - Nodes in the Power System

- The role of substations in a reliable electric grid
- How substations link the generator to the transmission and distribution system
- Types of substations; Step up and step down
- Major substation components and their function
- SCADA systems and the role of substations in controlling power flow across the supply chain

Transmission Lines – The Bulk Power Movers in the Power System

- The role of transmission lines in a reliable electric grid
- The need for high voltage transmission lines
- System loss reduction due to transmission lines and power flow across the supply chain
- How transmission lines link substations
- Types of transmission lines
- Voltages and design
- AC vs. DC transmission lines and their pros & cons
- First contingency planning and the evolution of the transmission system
- Major transmission components and their function

WEDNESDAY, OCTOBER 16, 2019

8:00 – 8:30 am **Continental Breakfast**

8:30 am – 12:00 pm **Course Timing**

Distribution System – The Link to the Customer

- The role of the distribution system in the supply chain
- The primary and secondary distribution lines
- Major distribution system components and their function
- How the distribution lines connect to the customer
- System loss at the distribution level
- Power factor correction on the distribution system
- Types of distribution lines
- Voltages and overhead/underground design

System Problems – New Challenges

- Operating in a difficult environment
- Power quality
- Different types of loads which are computer managed
- Regional blackouts 8/14/2003 and 9/8/2011 and their aftermath

The Future Utility and the Paradigm Shift

- The evolution of the historical utility business model
- Strategic technologies are changing the marketplace
- Customer self-generation with solar and batteries and their role in the paradigm shift
- Stagnant energy growth and electricity use
- Renewable and energy portfolio standards
- Energy efficiency and demand response's role in the new utility marketplace
- The need for non-traditional electric rates and the leading players in the rate evolution
- Changing customer's needs, wants, expectations and demographics and how utilities must adapt
- Residential, commercial, and industrial load profiles and demand drivers

INSTRUCTOR



Wallace L. Barron

President, Barron & Associates, Corporate Solutions, LLC

Mr. Barron has over four decades of experience in the electric energy industry. He is currently the President of the consulting firm, Barron & Associates, Corporate Solutions, LLC, located in Atlanta, which specializes in consulting to the energy industry in the areas of Strategic Planning, Board leadership and governance, DSM, Marketing, Customer Service, Key Accounts and Competitive issues. He was the Vice President of DSM, Marketing, Customer Service & Distribution Technology at Florida Power Corporation in St. Petersburg, Florida. His responsibilities included all of the DSM programs, developing and managing the strategic plan for the distribution sector, Forecasting, Key Accounts, Rates, System Planning, Competitive Marketing, Market Research, Customer Service, Economic Development, Load Management and Load Research, as well as the Distribution Engineering functions. He was responsible for the Customer, Energy, and Demand Forecasts from 1977 to 1990.

Mr. Barron also has extensive experience in the areas of System Planning, Pricing, Wholesale Marketing, and Transmission Design during his forty years in the energy industry and was president of two unregulated subsidiaries developing Cogeneration Projects. He is the past Chairman of the IEEE System Planning Subcommittee, the NERC Load Forecasting Working Group and the IEEE Load Forecasting Working Group. He was Chairman of the EPRI Power Electronics & Controls Task Force. Mr. Barron facilitates strategic planning activities for utilities and delivers a variety of Director and Policy Makers seminars on governance issues for the National Rural Electric Cooperative Association (NRECA) and the American Public Power Association (APPA). He has also taught at the Center for Professional Advancement in New Jersey and engineering courses at the University of South Florida in Tampa. He has also participated as a speaker in many IEEE, EEI, EPRI, NRECA, APPA and Statewide Association conferences. Mr. Barron holds a Master of Science Degree in Electrical Engineering from Mississippi State University. Mr. Barron has been an expert witness in the areas of System Planning, DSM, Forecasting, Load Research, and Market Research and has submitted testimony on those topics in dockets before the Florida Public Service Commission and the Federal Energy Regulatory Commission.



"Wallace was an excellent and engaging speaker. The material was never a drag, and his sense of humor made the content fun and accessible."

Energy Analyst,
J. Pollock Inc.



"Wallace was an engaging and knowledgeable presenter. I learned a lot in a short time. More importantly, I have lots of questions to return with to reexamine my organization with what I've learned and how we can improve."

Proposal Writer, Hexagon Safety & Infrastructure



"Mr. Barron is extremely knowledgeable about the industry and has great energy conducting the class. Wonderful speaker and overall incredible individual! I'd love to take another class taught by Mr. Barron!"

External Affairs Manager, Commonwealth Edison

INSTRUCTIONAL METHODS

PowerPoint presentations will be used in this program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for a minimum of four hours to be eligible for any continuing education credit.

IACET CREDITS



EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.1 CEUs for the course

EVENT LOCATION

A room block has been reserved at the Hyatt Regency Suites Atlanta Northwest, 2999 Windy Hill Rd SE, Marietta, GA 30067, for the nights of October 14-16, 2019. Room rates are \$151 plus applicable tax. Call **1-770-956-1234** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is September 14, 2019 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to this conference may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

To Register Click Here, or

EVENT LOCATION

Mail Directly To:

PMA Conference Management
PO Box 2303
Falls Church VA 22042
201 871 0474
Fax 253 663 7224
register@pmaconference.com

A room block has been reserved at the Hyatt Regency Suites Atlanta Northwest, 2999 Windy Hill Rd SE, Marietta, GA 30067, for the nights of October 14-16, 2019. Room rates are \$151 plus applicable tax. Call **1-770-956-1234** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is September 14, 2019 but as there are a limited number of rooms available at this rate, the room block may close sooner. **Please make your reservations early.**

PLEASE REGISTER

ELECTRIC UTILITIES 101 COURSE:
OCTOBER 15-16, 2019: US \$1395
Early bird on or before September 27, 2019: US \$1195

ENERGIZE WEEKLY

EUCI's Energize Weekly e-mail newsletter compiles and reports on the latest news and trends in the energy industry. Newsletter recipients also receive a different, complimentary course presentation every week on a relevant industry topic. The presentations are selected from a massive library of more than 1,000 current presentations that EUCI has gathered during its 30 years organizing courses.

Sign me up for Energize Weekly

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name Job Title

Company

What name do you prefer on your name badge?

Address

City State/Province Zip/Postal Code Country

Phone Email

List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card Billing Address

Account Number Billing City Billing State

Exp. Date Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx) Billing Zip Code/Postal Code

OR Enclosed is a check for \$ _____ to cover _____ registrations.

Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before September 13, 2019 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCI's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices. EUCI reserves the right to alter this program without prior notice.